

REMARKS**I. General**

The issues outstanding in the instant application are as follows:

- Claim 36 stands rejected under 35 U.S.C. § 112, second paragraph;
- Claims 1, 3-5, 22, 23 and 27-31 stand rejected under 35 U.S.C. § 103(a) as unpatentable over *Alamouti et al.*, U.S. Pat. No. 5,933,421 (hereinafter *Alamouti '421*), in view of *Brucket*, U.S. Pat. No. 5,038,399 (hereinafter *Brucket*);
- Claims 2, 7-21, 32,33,35 and 36 stand rejected under 35 U.S.C. § 103(a) as unpatentable over *Alamouti '421*, in view of *Larsson*, U.S. Pat. No. 5,956,642 (hereinafter *Larsson*), and further in view of *Brucket*; and
- Claims 6 and 24-26 stand rejected under 35 U.S.C. 103(a) as unpatentable over *Alamouti '421*, in view of *Brucket*, and further in view of *Alamouti*, U.S. Pat. No. 6,600,776 (hereinafter *Alamouti '776*).

Applicant hereby traverses the outstanding rejections of the claims, and request reconsideration and withdrawal of the outstanding rejections in light of the amendments and remarks contained herein. Claims 1-33 , 35 and 36 are currently pending in this application.

II. Rejection under 35 U.S.C. 112, second paragraph;

Claim 36 stands rejected under 35 U.S.C. 112, second paragraph as being dependent on a canceled claim, claim 34. In response Applicant has amended claim 36 to depend from independent claim 32.

III. Rejections under 35 U.S.C. §103(a)

Claims 1, 3-5, 22, 23 and 27-31 stand rejected under 35 U.S.C. § 103(a) as unpatentable over *Alamouti '421*, in view of *Brucket*. Claims 2, 7-21, 32,33,35 and 36 stand rejected as unpatentable over *Alamouti '421*, in view of *Larsson*, and further in view of *Brucket*. Claims 6 and 24-26 stand rejected as unpatentable over *Alamouti '421*, in view of

Brucket, and further in view of *Alamouti* '776. Applicant respectfully traverses these rejections for the reasons advanced below.

A Prima Facie case of obviousness has not been established.

To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art cited must teach or suggest all the claim limitations. See M.P.E.P. § 2143. Without conceding the second criterion, Applicant asserts that the rejection does not satisfy the first and third criteria.

A. The recited combination does not teach or suggest all claimed limitations.

1. Claims 1, 3-5, 22, 23 and 27-31

In addressing claims 1, 3-5, 22, 23 and 27-31, the Office Action admits that *Alamouti* '421 does not teach:

the logic selects a set of channels based on the feedback channel information from the subscribers and channel information collected from at least one other base station or at the base station or allocating a channels through a collaborative channel assignment among multiple base stations.

The Office Action attempts to cure this deficiency by introducing *Brucket*, which the Office Action alleges to teach:

a system and method for selecting channels based on the feedback information such the measured value of RSSI, carrier to interference, CIR 'channel characteristic' (Fig 2, Ref 205 and 210 discloses the subscribers of the system measures the received signal from the base stations and feedback this information to the base stations and the collected information from a serving base station (Fig 2, Ref 220) and the neighboring base station (Fig 2, Ref 225) and a logic unit (Fig 3, Ref 300 for receiving these information and using these information for selecting the channels, Fig 2, Ref 215 and 255 wherein reuse level includes at least one channels, See col. 4,

line 29 to col. 5, line 7 and col. 7, lines 48-67).

However, this combination, as presented, does not teach or suggest all limitations of the claimed invention, particularly in light of the amendments advanced above.

Independent claim 1 has been amended to recite:

the logic selecting a set of OFDMA traffic channels from a plurality of candidate OFDMA traffic channels, based on feedback OFDMA channel information collected from the plurality of subscribers and OFDMA channel information collected from at least one of the other base stations, and in collaboration with said at least one other base station to provide joint OFDMA channel allocation to multiple ones of said plurality of subscribers.

Similarly, independent claim 22 has been amended to recite:

assigning OFDMA traffic channels for an OFDMA network, based on received OFDMA channel characteristics and noise-plus-interference information measured at the spatially distributed subscribers and the OFDMA channel characteristics information from the at least one other base station, and in collaboration with at least said one other base station to provide joint OFDMA channel allocation to multiple ones of said subscribers.

Also claim 27 has been amended to recite:

a radio frequency transmitter to transmit information on OFDMA traffic channels jointly allocated to a plurality of subscribers through a collaborative OFDMA channel assignment among multiple base stations.

Support for the amendments to claims 1, 22 and 27 may be found at least on page, 19, lines 3-10, and page 22, lines 6-15.

The combination of *Alamouti* '421 and *Bruckert* fails to teach or suggest the above-quoted limitations, particularly collaboration of base stations to provide joint OFDMA channel allocation to multiple subscribers, or the like. The Office Action admits that *Alamouti* '421 fails to teach the selecting a set of channels based on the feedback channel

information from the subscribers and channel information collected from at least one other base station or at the base station or allocating a channels through a collaborative channel assignment among multiple base stations. Thus, Applicant respectfully asserts that *Alamouti* '421 does not teach or suggest collaboration of base stations to provide joint OFDMA channel allocation to multiple subscribers, or the like.

Without admitting that *Brucket* teaches any elements admitted by the Office Action as missing from *Alamouti* '421, Applicant respectfully asserts that *Brucket* does not teach or suggest collaboration of base stations to provide joint OFDMA channel allocation to multiple subscribers, or the like, either. For example, *Brucket* merely teaches assignment of a reuse level based on a reuse level gradient, see cited column 5, lines 4-7, not collaboration of base stations to provide joint OFDMA channel allocation to multiple of subscribers, or the like.

Therefore, Applicant respectfully asserts that at least for the above reasons independent claims 1, 22 and 27, particularly, as amended, are patentable over the 35 U.S.C. § 103(a) rejections of record. Claims 3-5 ultimately depend from independent claim 1; claim 23 ultimately depends directly from independent claim 22; and claims 28-31 ultimately depend from independent claim 27. Thereby, each of claims 3-5, 22 and 28-31 inherits all limitations of respective independent claims 1, 22 or 27. Thusly, for at least the reasons advanced above in addressing claims 1, 22 and 27, as amended, each of claims 3-5, 22 and 28-31 sets forth features and limitations not recited by the combination of *Alamouti* '421 and *Brucket*. Therefore, Applicant respectfully asserts that claims 3-5, 22 and 28-31 are also patentable over the 35 U.S.C. § 103(a) rejections of record.

2. Claims 2, 7-21, 32, 33, 35 and 36

In addressing claims 2, 7-21, 32, 33, 35 and 36, the Office Action admits that *Alamouti* '421 does not teach:

calculating spatial gains of uplink and downlink based on responses of the spatially separated receivers at the base station wherein channel condition regarding estimating channel gains and interference and antennas; estimating SINR for uplink and downlink signals for using to assigning the traffic channels; estimating SINR for uplink and downlink for accessing and active subscribers and assigning channels to the plurality of

subscribers based on channel condition information and estimating gains for uplink and downlink signals for the plurality of subscribers.

The Office Action attempts to cure this deficiency by introducing *Larsson*, which the Office Action alleges to teach:

a system for calculating spatial gains of uplink and downlink based on responses of the spatially separated receivers at the base station wherein channel condition regarding estimating channel gains and interference and antennas; estimating SINR for uplink and downlink signals for using to assigning the traffic channels, for accessing and active subscribers

Additionally, the Office Action admits that the combination of *Alamouti '421* and *Larsson* does not teach:

assigning channels to the plurality of subscribers based on channel condition information and estimating gains for uplink and downlink signals for the plurality of subscribers or assigning channels based on and the feedback information from the subscribers and at least two base stations

The Office Action attempts to cure this deficiency by introducing *Brucket*, which the Office Action alleges to teach:

assigning the channels to subscribers based on the channel condition information and estimating gains for uplink and downlink signals for the plurality of subscribers or assigning channels based on and the feedback information from the subscribers and at least two base stations and uplink estimator

However, this combination, as presented, does not teach or suggest all limitations of the claimed invention.

As to claim 2, claim 2 depends directly from claim 1 and thereby inherits all limitations of independent claim 1, as amended. As pointed-out above, *Alamouti '421* and *Brucket* fail to disclose or suggest at least collaboration of base stations to provide joint OFDMA channel allocation to multiple of subscribers, as recited in claim 1, as amended.

The Office Action does not rely on *Larsson*, as disclosing these limitations. Therefore, Applicant respectfully asserts that claim 2 is patentable over the § 103(a) rejection of record.

Independent claim 7, as amended, recites:

performing OFDMA multi-user traffic channel assignment to assign OFDMA traffic channels from the plurality of OFDMA traffic channels to the plurality of subscribers, based on the OFDMA channel condition information received from at least one of said subscribers and at least one other of said base stations and estimated spatial gains for the uplink and downlink signals for the plurality of subscribers, and in collaboration with said at least one other of said base stations to provide joint OFDMA channel allocation to multiple ones of said plurality of subscribers.

Independent claim 32, as amended, recites:

a multi-user traffic channel allocator coupled to the calculator and the estimator to determine OFDMA channel assignment based on broadband spatial channel estimates from the estimator and measured OFDMA channel and noise-plus-interference information feedback from subscribers and from at least two base stations to provide joint OFDM channel allocation to multiple subscribers

Support for the amendments to claims 7 and 32 may be found at least on page, 19, lines 3-10, and page 22, lines 6-15.

The combination of *Alamouti '421*, *Larsson* and *Bruckert* fails to teach or suggest the above-quoted limitations, particularly collaboration of base stations to provide joint OFDMA channel allocation to multiple subscribers, or the like. The Office Action admits that the combination of *Alamouti '421* and *Larsson* fails to teach assigning channels to a plurality of subscribers based on channel condition information or assigning channels based on and the feedback information from the subscribers and at least two base stations. Thus, Applicant respectfully asserts that the combination of *Alamouti '421* and *Larsson* does not teach or suggest base stations collaborating to perform joint OFDMA multi-user traffic channel assignment to provide joint OFDMA channel allocation and/or a multi-user traffic channel

allocator coupled to a calculator and estimator to provide joint OFDM channel allocation to multiple subscribers, as recited in independent claims 7 and 32, respectively. Without admitting that *Brucket* teaches any elements admitted by the Office Action as missing from the combination of *Alamouti '421* and *Larsson*, Applicant respectfully asserts that *Brucket* does not teach or suggest collaboration of base stations to provide joint OFDMA channel allocation to multiple subscribers, or the like. For example, *Brucket* merely teaches assignment of a reuse level based on a reuse level gradient, see cited column 5, lines 4-7, not base stations collaborating to perform joint OFDMA multi-user traffic channel assignment to provide joint OFDMA channel allocation, nor a multi-user traffic channel allocator coupled to a calculator and estimator to provide joint OFDM channel allocation to multiple subscribers.

Therefore, Applicant respectfully asserts that at least for the above reasons independent claims 7 and 32, particularly, as amended are patentable over the 35 U.S.C. § 103(a) rejections of record. Claims 8-21 ultimately depend from independent claim 7 and claims 33, 35 and 36 ultimately depend from independent claim 32. Thereby, each of claims 8-21, 33, 35 and 36 inherits all limitations of respective independent claims 7 or 32. Thusly, for at least the reasons advanced above in addressing claims 7 and 32, as amended, each of claims 8-21, 33, 35 and 36 sets forth features and limitations not recited by the combination of *Alamouti '421*, *Larsson* and *Brucket*. Therefore, Applicant respectfully asserts that claims 8-21, 33, 35 and 36 are also patentable over the 35 U.S.C. § 103(a) rejections of record.

3. Claims 6 and 24-26

In addressing claims 6 and 24-26, the Office Action admits that *Alamouti '421* does not teach:

the subscriber uses the allocated channel for conveying the packets using MAC and receiving an allocation of at least one channels allocated in response to the measured channel and noise plus interference information and channel information from the base station including a second base station other than the first base station

The Office Action attempts to cure this deficiency by introducing *Brucket*, which the Office Action alleges to teach:

selecting at least one channels "reuse level" in response to the measured channel, noise plus interference and channel information from the base station includes a second base station other than the first base station

Additionally, the Office Action admits that the combination of *Alamouti '421* and *Brucket* does not teach "the subscriber uses the allocated channel for conveying the packets using MAC." The Office Action attempts to cure this deficiency by introducing *Alamouti '776*, which the Office Action alleges to teach "assigning channels for conveying the data packets between the base and mobile based the feedback information on the channels and using MAC."

However, the combination of *Alamouti '421*, *Brucket* and *Alamouti '776*, as presented, does not teach or suggest all limitations of the claimed invention.

As to claim 6, claim 6 depends directly from claim 1 and thereby inherits all limitations of independent claim 1, as amended. As pointed-out above, the combination of *Alamouti '421* and *Brucket* fails to disclose or suggest at least collaboration of base stations to provide joint OFDMA channel allocation to multiple of subscribers, as recited in claim 1, as amended. The Office Action does not rely on *Alamouti '776*, as disclosing these limitations. Therefore, Applicant respectfully asserts that claim 6 is patentable over the § 103(a) rejection of record.

Independent claim 24, as amended, recites:

receiving, by one of said subscribers, an allocation of one or more OFDMA traffic channels allocated, in response to the measured channel and noise-plus-interference information and OFDMA channel information from a plurality of base stations including a second base station other than the first base station, and in collaboration with at least said second base station to provide joint OFDMA channel allocation to multiple ones of said plurality of subscribers

Support for the amendments to claim 24 may be found at least on page, 19, lines 3-10 and page 22, lines 6-15 of the present specification.

The combination of *Alamouti* '421, *Brucket* and *Alamouti* '776 fails to teach or suggest the above-quoted limitations, particularly collaboration with at least a second base station to provide joint OFDMA channel allocation to multiple ones of said plurality of subscribers. The Office Action admits that *Alamouti* '421 fails to teach subscribers receiving an allocation of at least one channels allocation from "the base station including a second base station other than the first base station." Thus, Applicant respectfully asserts that *Alamouti* '421 does not teach or suggest collaboration with at least a second base station to provide joint OFDMA channel allocation to multiple ones of said plurality of subscribers, and the Office Action does not rely on *Alamouti* '776 as teaching this limitation.

Without admitting that *Brucket* teaches any elements admitted by the Office Action as missing from *Alamouti* '421, Applicant respectfully asserts that *Brucket* does not teach or suggest collaboration with at least a second base station to provide joint OFDMA channel allocation to multiple ones of said plurality of subscribers. As noted by the Office Action, *Brucket* merely teaches assignment of a reuse level based on a reuse level gradient, see cited column 5, lines 4-7, not collaboration of base stations to provide joint OFDMA channel allocation to multiple of subscribers, or the like.

Applicant respectfully asserts that at least for the above reasons independent claim 24, particularly as amended, is patentable over the 35 U.S.C. § 103(a) rejection of record. Claims 25 and 26 each depend directly from independent claim 24. Thereby, each of claims 25 and 26 inherits all limitations of respective independent claim 24. Thusly, for at least the reasons advanced above in addressing the rejection of independent claim 24, each of claims 25 and 26 sets forth features and limitations not recited by the combination of *Alamouti* '421, *Brucket* and *Alamouti* '776. Therefore, Applicant respectfully asserts that claims 25 and 26 are also patentable over the 35 U.S.C. § 103(a) rejections of record.

B. The Office Action does not provide the requisite motivation.

In addressing claims 1, 3-5, 22, 23 and 27-31, the Office Action admits that *Alamouti* '421 does not teach various limitation, and the Office Action attempts to cure this deficiency by introducing *Brucket*, alleging *Brucket* teaches the admittedly missing limitations. The motivation for combining *Alamouti* '421 and *Brucket* was provided as follows:

it would have been obvious to one of ordinary skill in the art at the time of the invention was made to apply a method and system for receiving the measured value of the uplink of the base stations and downlink of the subscribers for selecting the channels as disclosed Brucket into Alamouti's system and method. The motivation would have been to provide a reliable and relatively fast method for assigning the channels to the subscriber units

In addressing claims 2, 7-21, 32, 33, 35 and 36, the Office Action admits that *Alamouti* '421 does not teach various limitation and the Office Action attempts to cure this deficiency by introducing *Larsson*, which the Office Action alleges teaches the admittedly missing limitations. The Office Action goes on to admit that the combination of *Alamouti* '421 and *Larsson* fails to teach various limitations. The Office Action attempts to cure this deficiency by introducing *Brucket*, which the Office Action alleges teaches these admittedly missing limitations. The motivation for combining *Alamouti* '421, *Larsson* and *Brucket* was provided as follows:

it would have been obvious to one of ordinary skill in the art at the time of the invention was made to apply a method and system for determining the uplink and downlink channel condition and interference between the subscribers and the base station as disclosed by Brucket into the system and method of Larsson which measures the uplink and downlink gain, SNIR for using to select the channels into Alamouti '421. The motivation would have been to provide a reliable and relatively fast method for assigning the channels to the subscriber units and improve a method and system for channel reuse.

In addressing claims 6 and 24-26, the Office Action admits that *Alamouti* '421 does not teach various limitations and the Office Action attempts to cure this deficiency by introducing *Brucket*, alleging *Brucket* teaches the admittedly missing limitations.

Additionally, the Office Action admits that the combination of *Alamouti* '421 and *Brucket* does not teach various other limitations and the Office Action attempts to cure this deficiency by introducing *Alamouti* '776, which the Office Action alleges to teach the admittedly missing limitations. The motivation for combining *Alamouti* '421, *Brucket* and *Alamouti* '776 was provided as follows:

it would have been obvious to one of ordinary skill in the art at the time of the invention was made to apply MAC and packetizing for conveying information between the base and subscriber as disclosed by *Alamouti* '776 into a method and system of *Brucket* which use a channel selection scheme based on the pleasured channel and noise plus interference at the subscriber and channel information from the base stations into the system and method of *Alamouti* '421. The motivation would have been to provide a reliable and relatively fast method for assigning the channels to the subscriber units and improve a method and system for channel reuse.

It is well settled that the fact that references can be combined or modified is not sufficient to establish a prima facie case of obviousness, M.P.E.P. § 2143.01. Language such as “[t]he motivation would have been to provide a reliable and relatively fast method for assigning the channels to the subscriber units (and improve a method and system for channel reuse)” is tantamount to a mere statement that the reference can be modified, and does not state any desirability for making the modification. The Office Action fails to show how the various proposed combinations of references would provide a reliable and relatively fast method for assigning the channels to the subscriber units. The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ.2d 1430 (Fed. Cir. 1990), as cited in M.P.E.P. § 2143.01.

Further, Applicant respectfully points out the claims of the present application are directed to OFDMA (Orthogonal Frequency Division Multiple Access) systems, apparatuses and methods. Whereas *Alamouti* '421 and *Larsson* are directed systems that employ Orthogonal Frequency Duplex Multiplexing (OFDM), *Alamouti* '776 only makes passing mention of OFDM, and *Brucket* is silent concerning OFDMA, or even OFDM and only deals with TDMA. Applicant respectfully asserts that the present Office Action is employing

impermissible hindsight in order to piece together the elements of the claims based on knowledge gleaned from Applicant's disclosure. Applicant asserts that without the teachings of Applicant's disclosure one of ordinary skill in the art would not find it obvious to coordinate multiple-access and information exchange between a base station and a plurality of subscribers by selecting a set of OFDMA traffic channels based on feedback OFDMA channel information collected from a plurality of subscribers and OFDMA channel information collected from at least one other base, particularly in collaboration with the other base station(s) to provide joint OFDMA channel allocation to multiple subscribers. *Bruckert* only teaches assignment of a channel reuse level, based on a reuse level gradient, in a TDMA system, without addressing any of the particular interference and channel reuse issues present in an OFDMA system.

For at least the foregoing reasons, the motivation provided by the present Office Action is improper, as the motivation must establish the desirability for making the modification. No valid suggestion has been made as to why, absent the application of impermissible hindsight why a combination of *Alamouti '421*, *Bruckert*, *Larsson* and/or *Alamouti '776* is desirable. Therefore, the rejections under 35 U.S.C. § 103(a) should be withdrawn.

IV. Conclusion


For all the reasons given above, Applicant submits that the pending claims distinguish over the prior art under 35 U.S.C. § 103 and meet the requirements of 35 U.S.C. § 112. Accordingly, Applicant submits that this application is in full condition for allowance.

Applicant believes no fee is due with this response. However, if a fee is due, please charge Deposit Account No. 06-2380, under Order No. 68144/P013US/10502108, from which the undersigned is authorized to draw.

Applicant respectfully requests that the Examiner call the below listed attorney if the Examiner believes that the attorney can help in resolving any remaining issues or can otherwise be helpful in expediting prosecution of the present application.

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Respectfully submitted,

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